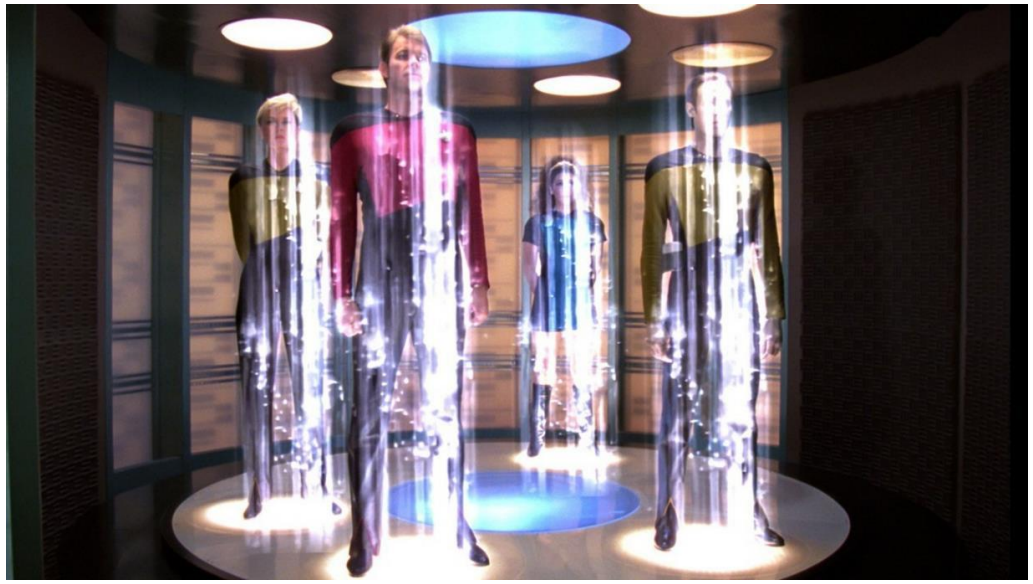
St Augustine's Men's Breakfast
St Augustine's Church,
5th December 2020



Looking Back to the Future or Forward to the Past? How will we travel in 2050?

Prof Simon Kingham

Tari Mātai Matawhenua | Dept of Geography, Te Whare Wānanga o Waitaha | University of Canterbury

Kaitohutohu Matua Pūtaiao | Chief Science Advisor, Te Manatū Waka | Ministry of Transport

What are our major transport challenges?

- Climate Change
- Safety
- Congestion
- Obesity
- Social equity
- Declining revenue

How do we travel today?

How will we travel in 15 years?

… and 40 years?

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Electric Vehicles (EVs)

Energy

- Fossil fuels
- Biofuels - fuels produced from renewable organic materials
  - bioethanol – corn & sugarcane
  - Biodiesel - vegetable and animal fat
  - Usually blended with petrol or diesel
  - Z Biofuel plant in NZ – but hibernated
    - https://www.newsroom.co.nz/2020/05/13/1168342/z-hibernates-beleaguered-biofuels-plant
  - Land use implications

https://www.scionresearch.com/science/bioenergy/nz-biofuels-roadmap

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Energy

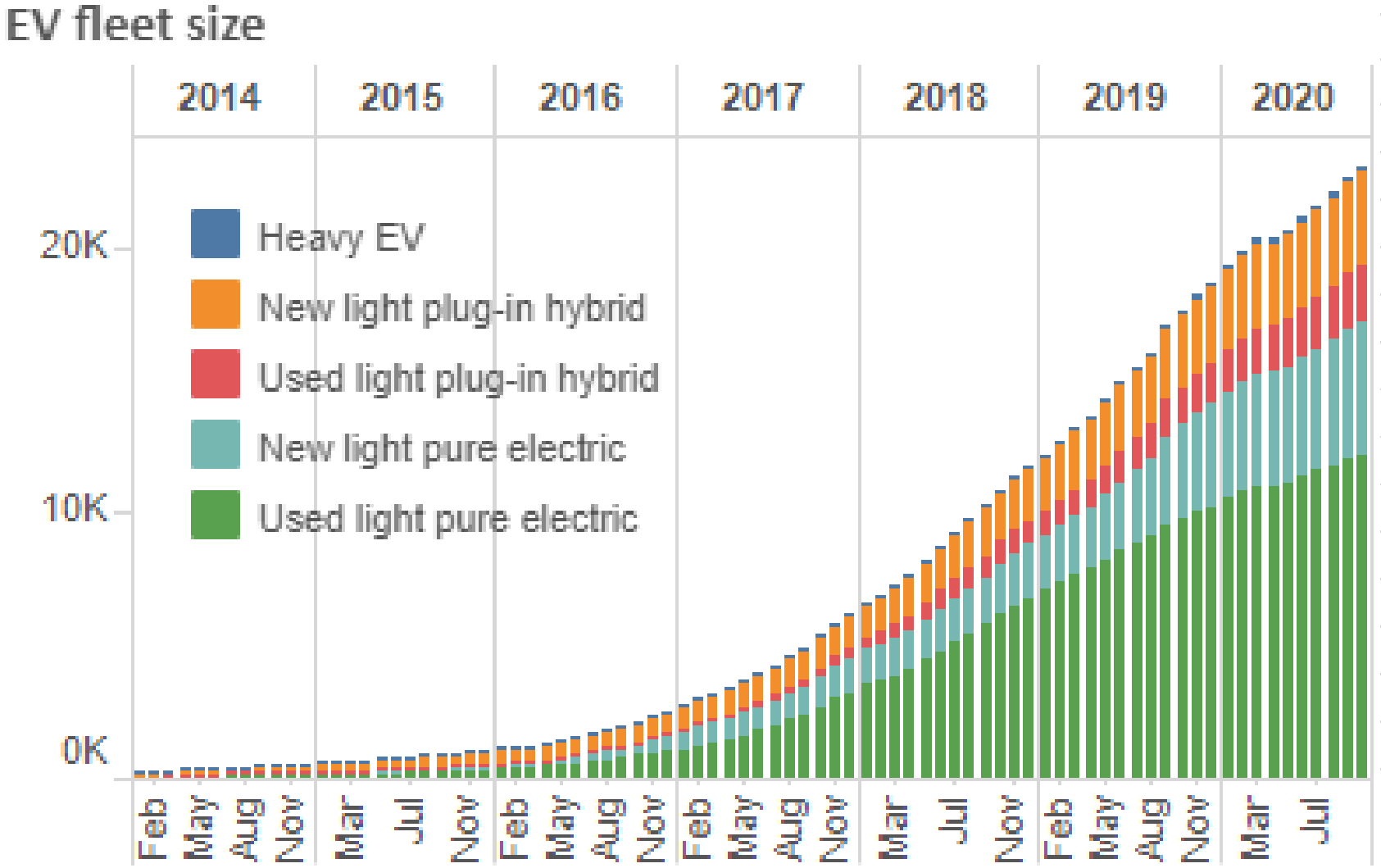
- Electric
- Renewable
- Hydrogen

Hydrogen

- ***Green*** hydrogen - produced by splitting water molecules into the constituent elements of hydrogen and oxygen, using electricity to power an electrolyser
  - Renewable?
- Fuel cell that transforms the hydrogen directly into electricity to power electric motor/s
- Hydrogen fuel cell electric vehicles (FCEV)

https://www.mbie.govt.nz/have-your-say/a-vision-for-hydrogen-in-new-zealand-public-consultation/

Electric



Total[1][2] registered vehicles by type

As at 30 November 2020

Vehicle Type	
Total	**5,432,893**
AGRICULTURAL MACHINE	2,757
ATV	7,837
BUS	32,325
GOODS VAN/TRUCK/UTILITY	789,136
HIGH SPEED AGRICULTURAL VEHICLE	142
MOBILE MACHINE	22,913
MOPED	31,521
MOTOR CARAVAN	47,449
MOTORCYCLE	164,279
PASSENGER CAR/VAN	3,481,189
SPECIAL PURPOSE VEHICLE	3,294
TRACTOR	45,943
TRAILER NOT DESIGNED FOR H/WAY USE	981
TRAILER/CARAVAN	803,127

https://www.nzta.govt.nz/resources/new-zealand-motor-vehicle-register-statistics/national-vehicle-fleet-status/

https://www.transport.govt.nz/statistics-and-insights/fleet-statistics/monthly-ev-statistics/

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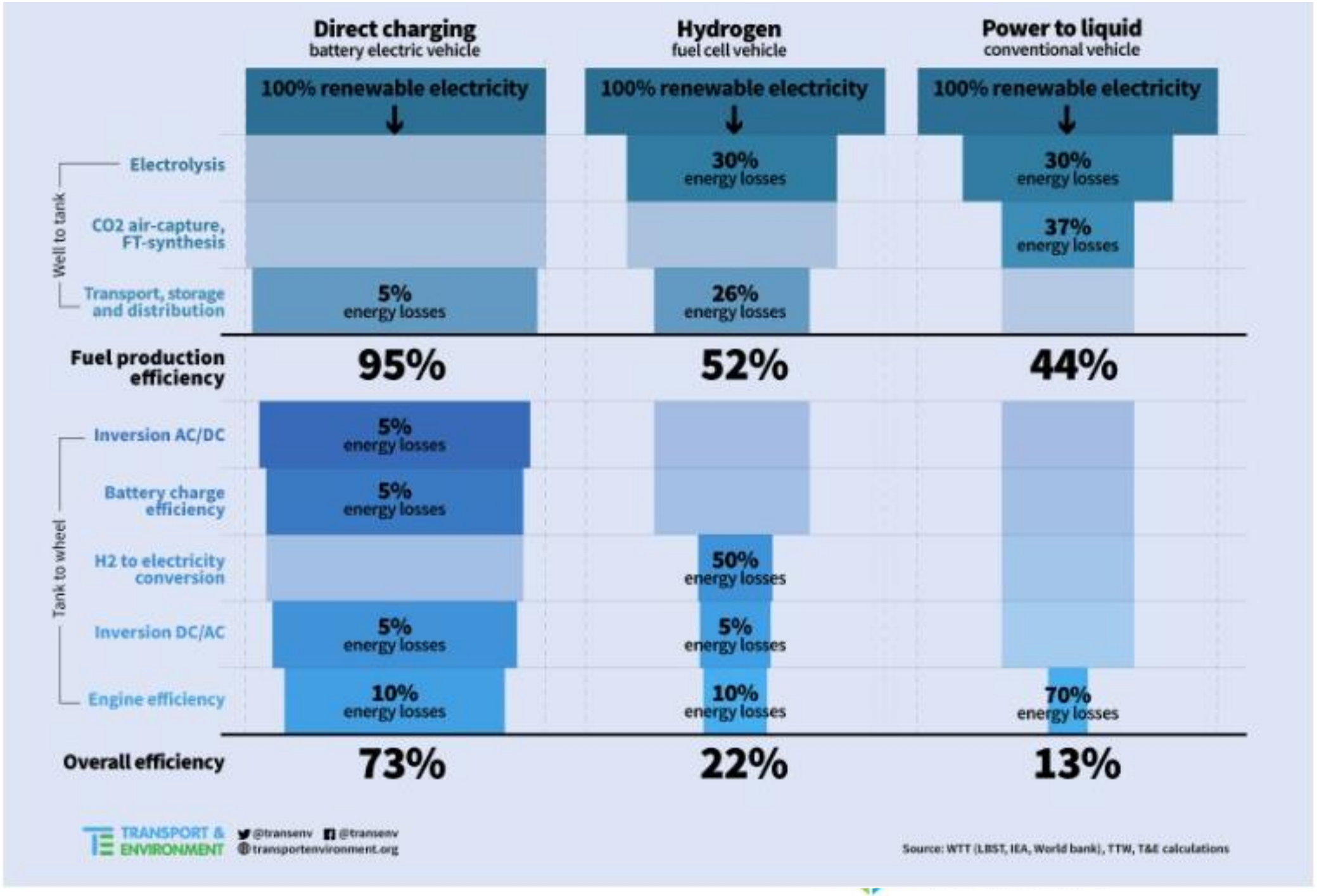

https://www.transportenvironment.org/sites/te/files/publications/2017_11_Briefing_electrofuels_final.pdf

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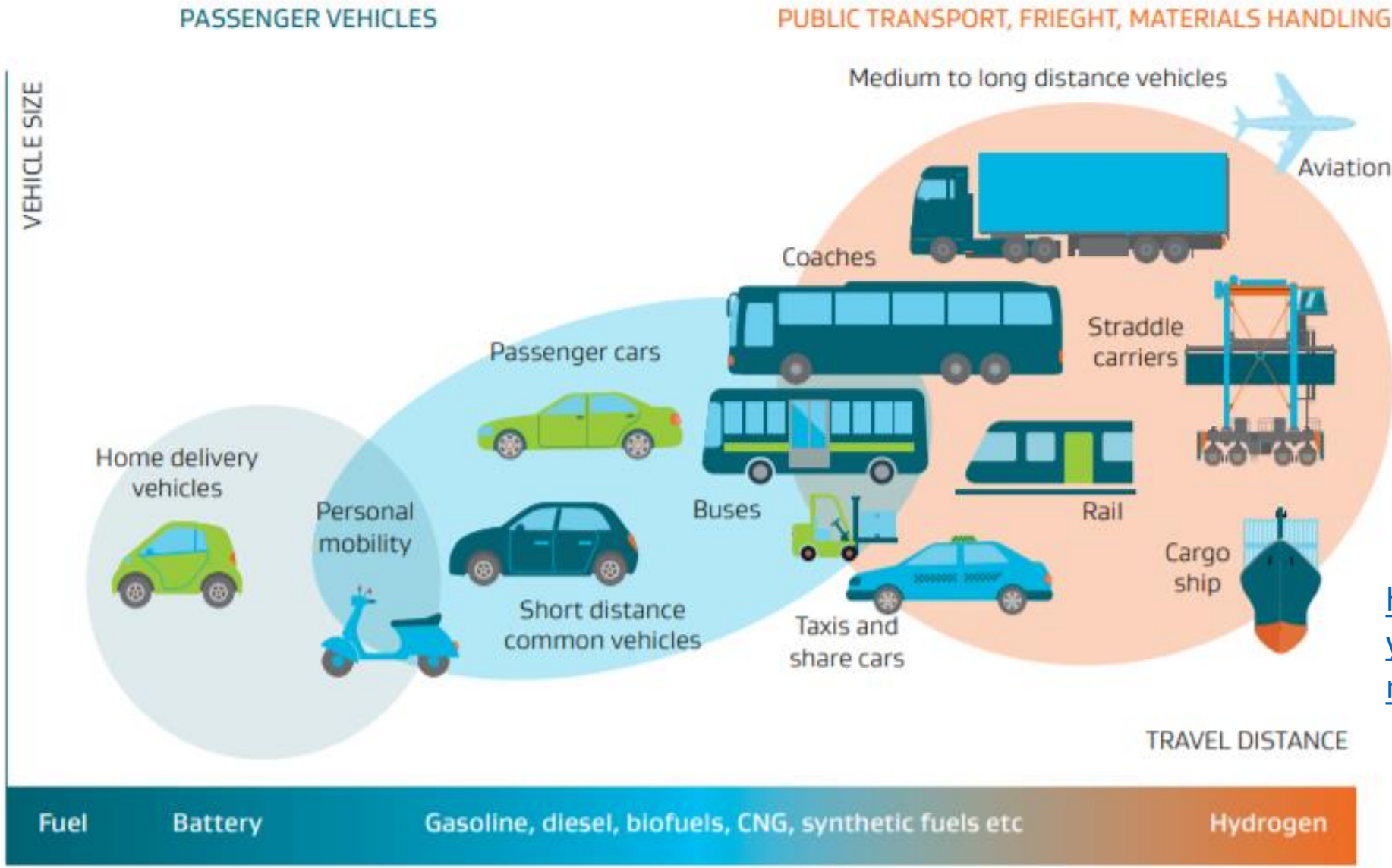
Fuel electric cell vehicles



https://www.mbie.govt.nz/have-your-say/a-vision-for-hydrogen-in-new-zealand-public-consultation/

Figure 16: Vehicles that can be powered by hydrogen or electricity (17)

Autonomous vehicles

How many of you have ever been in an autonomous car?

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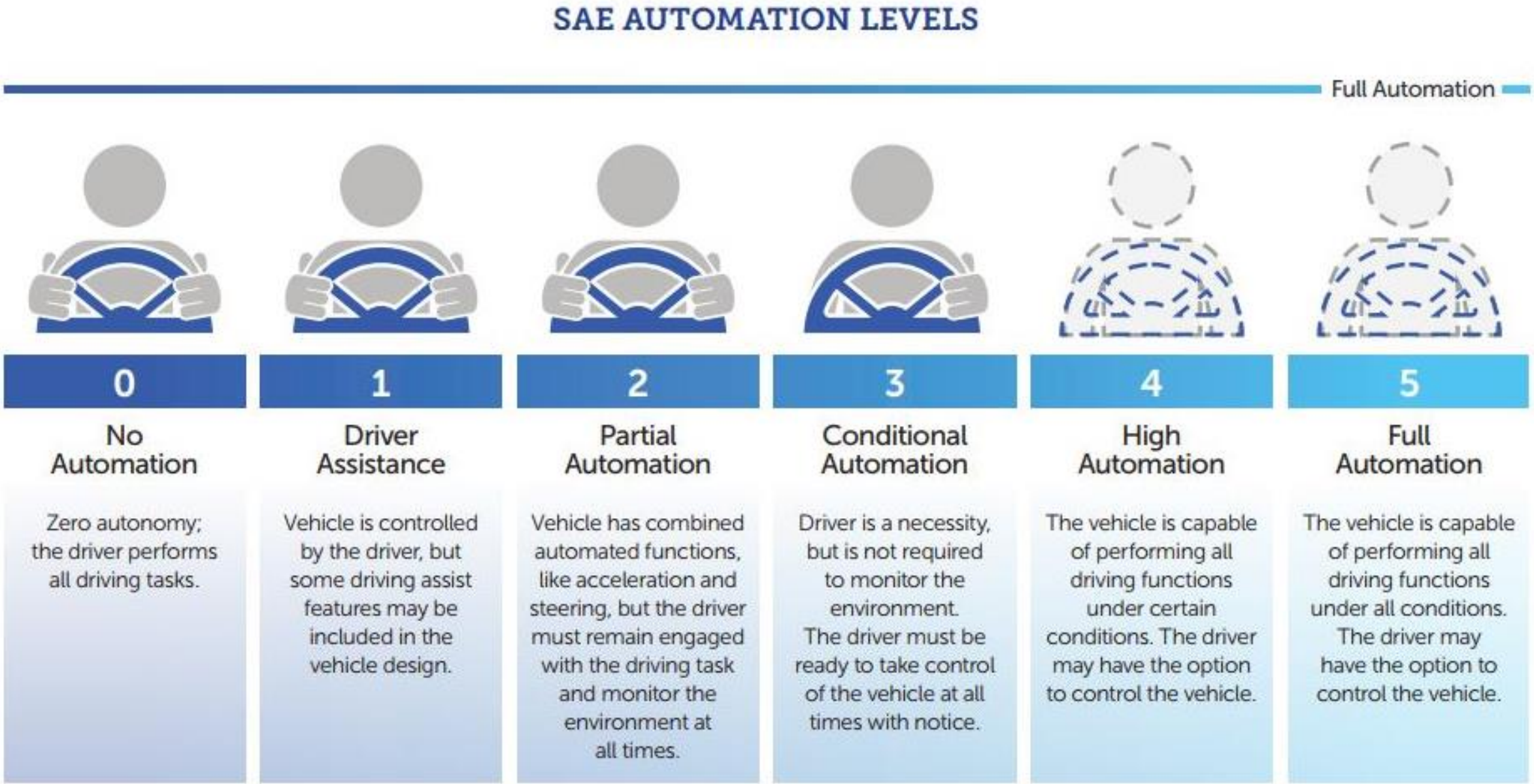
Autonomous vehicles




CITY TOUR
ROLLICKIN dessert cafe
open 7 days
11AM to 10PM
152
TRAMWAYS.
ohmio
HOP
PROUDLY DESIGNED IN AOTEAROA

Fully autonomous vehicles

With the potential for human error removed, self-driving cars will reduce instances of accidents caused by driver error, drunk driving or distracted drivers.

Once driverless cars become commonplace on our streets, it is expected that accidents are likely to fall by a whopping 90%.

- https://onlinemasters.ohio.edu/blog/the-future-of-driving/

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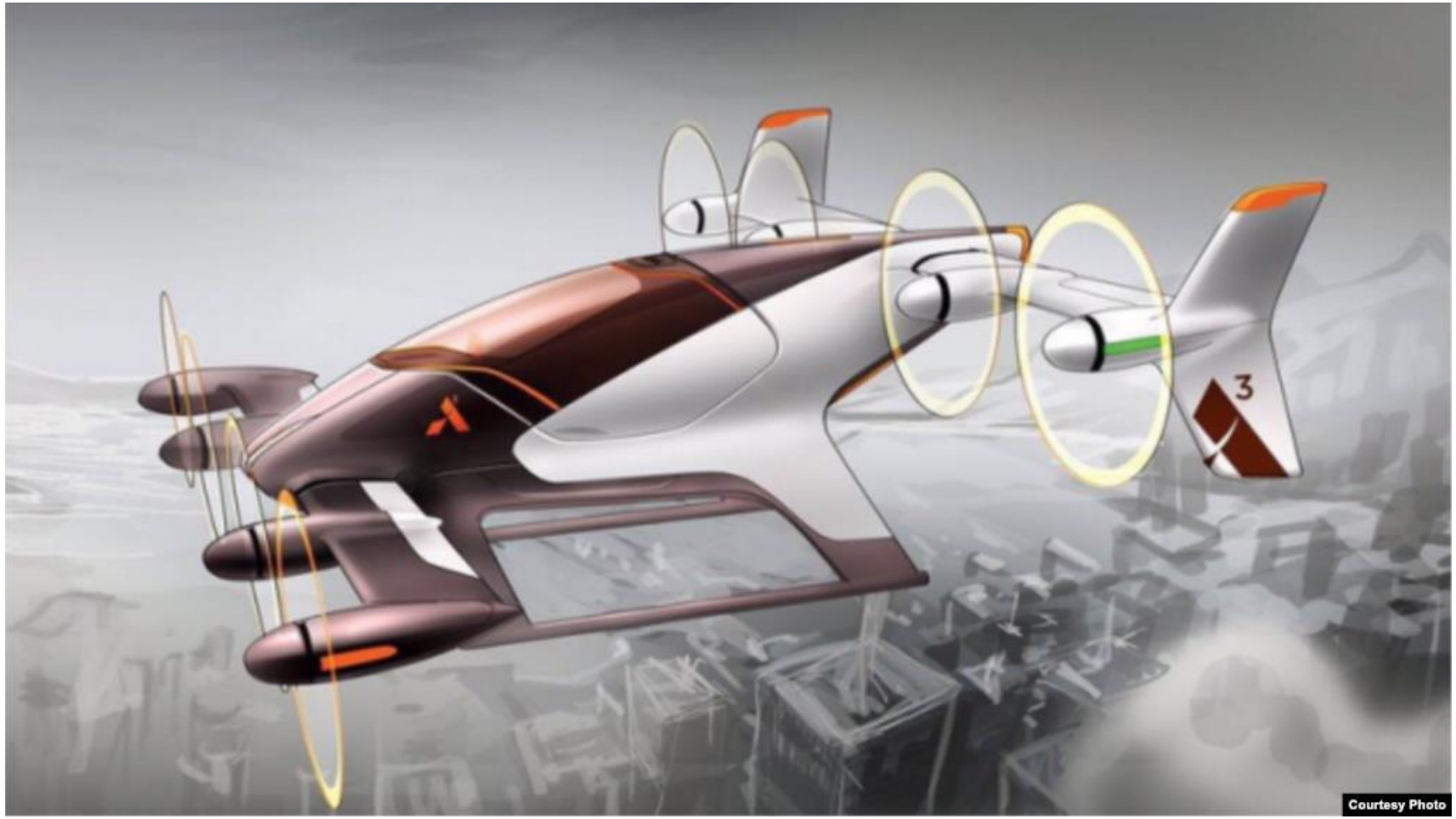
Other vehicles

Electric planes

Airbus



https://learningenglish.voanews.com/a/airbus-plans-to-test-self-flying-air-taxi-vehicle-in-2017/3681699.html

Electric planes

Uber

https://learningenglish.voanews.com/a/airbus-plans-to-test-self-flying-air-taxi-vehicle-in-2017/3681699.html

Electric planes

https://www.aeromobil.com/aeromobil-4_0-stol/

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Electric planes

https://zunum.aero/aircraft/

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Solar planes

https://dronecenter.bard.edu/high-altitude-drones/

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When and how big?

- Small and short distances first
- https://www.cnbc.com/2019/12/20/electric-planes-where-are-they.html

Air travel – Biofuels

Biofuel a long-term bet: Luxon

5 Oct, 2016 12:53pm

3 minutes to read

- https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11723018

Hydrogen

This company wants to fill the skies with hydrogen-powered planes by 2022

ZeroAvia claims its prototype is the world's largest zero-emission aircraft flying without any fossil fuel support

By Andrew J. Hawkins | @andyjayhawk | Aug 14, 2019, 6:00am EDT

https://www.theverge.com/2019/8/14/20804257/zeroavia-hydrogen-airplane-electric-flight

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Hyperloop

Hyperloop

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Slower

Trackless tram

- Flexibility and capacity?

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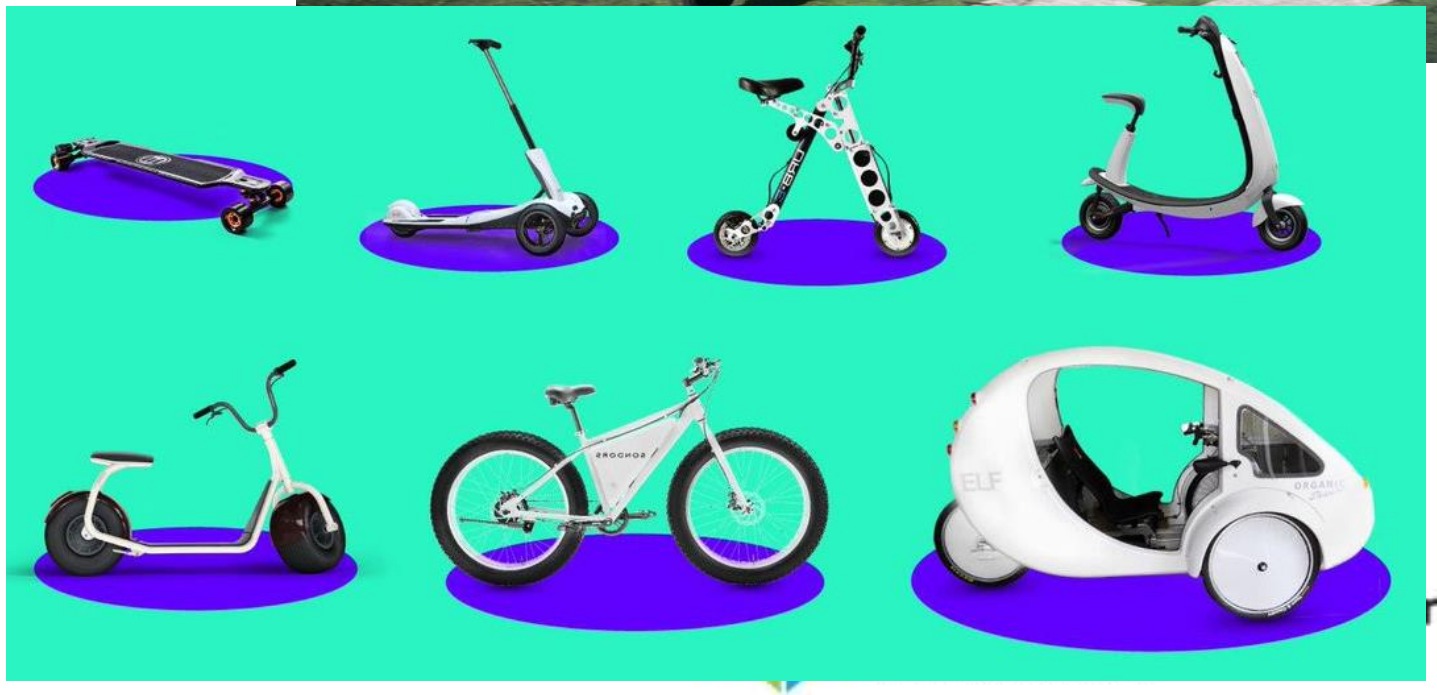
Flexible

On-demand – e.g. Timaru

- http://www.mywaybymetro.co.nz/

Micromobility



Advantages of micromobility

- Reducing GHG Emissions and Improve air pollution
- Enhancing efficiency
  - 22 kgs vs 1300 kgs
- Save money
  - 1 % cost of fueling a car
- Open up public transport
  - First- and last-mile transport
- Fun!

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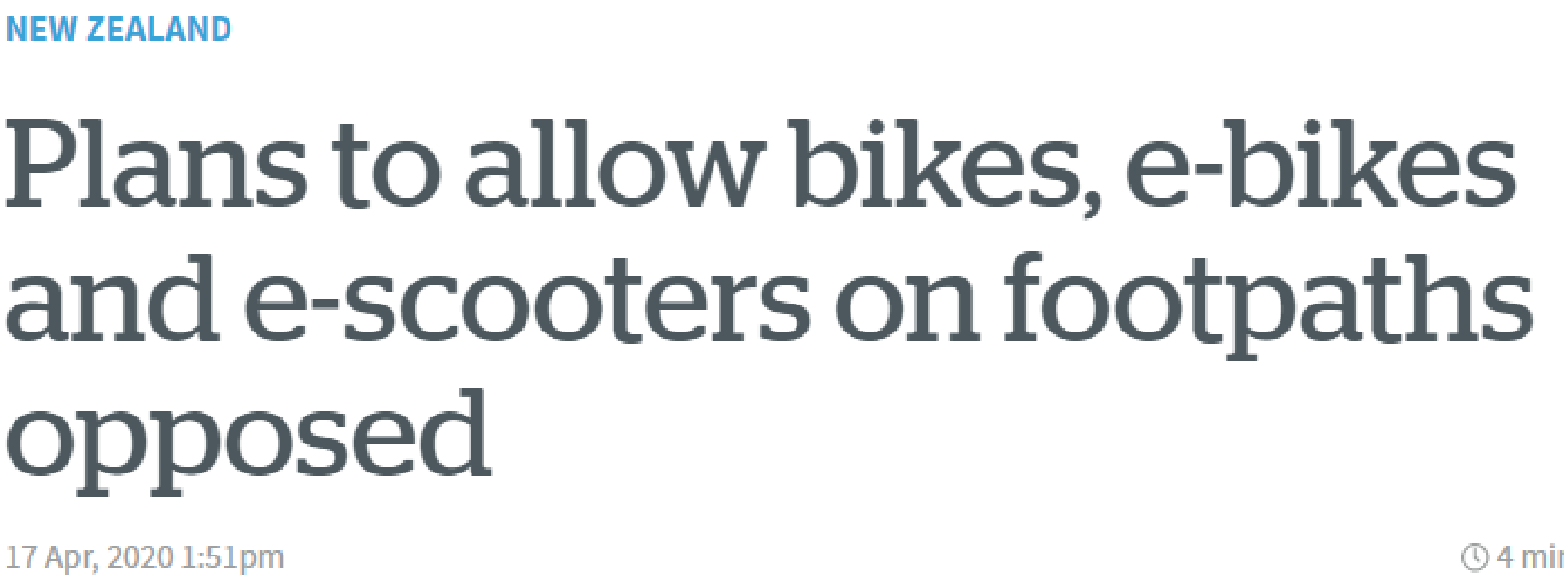
Concerns of micromobility



NEW ZEALAND

Plans to allow bikes, e-bikes and e-scooters on footpaths opposed

17 Apr, 2020 1:51pm

4 mi

https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12325605

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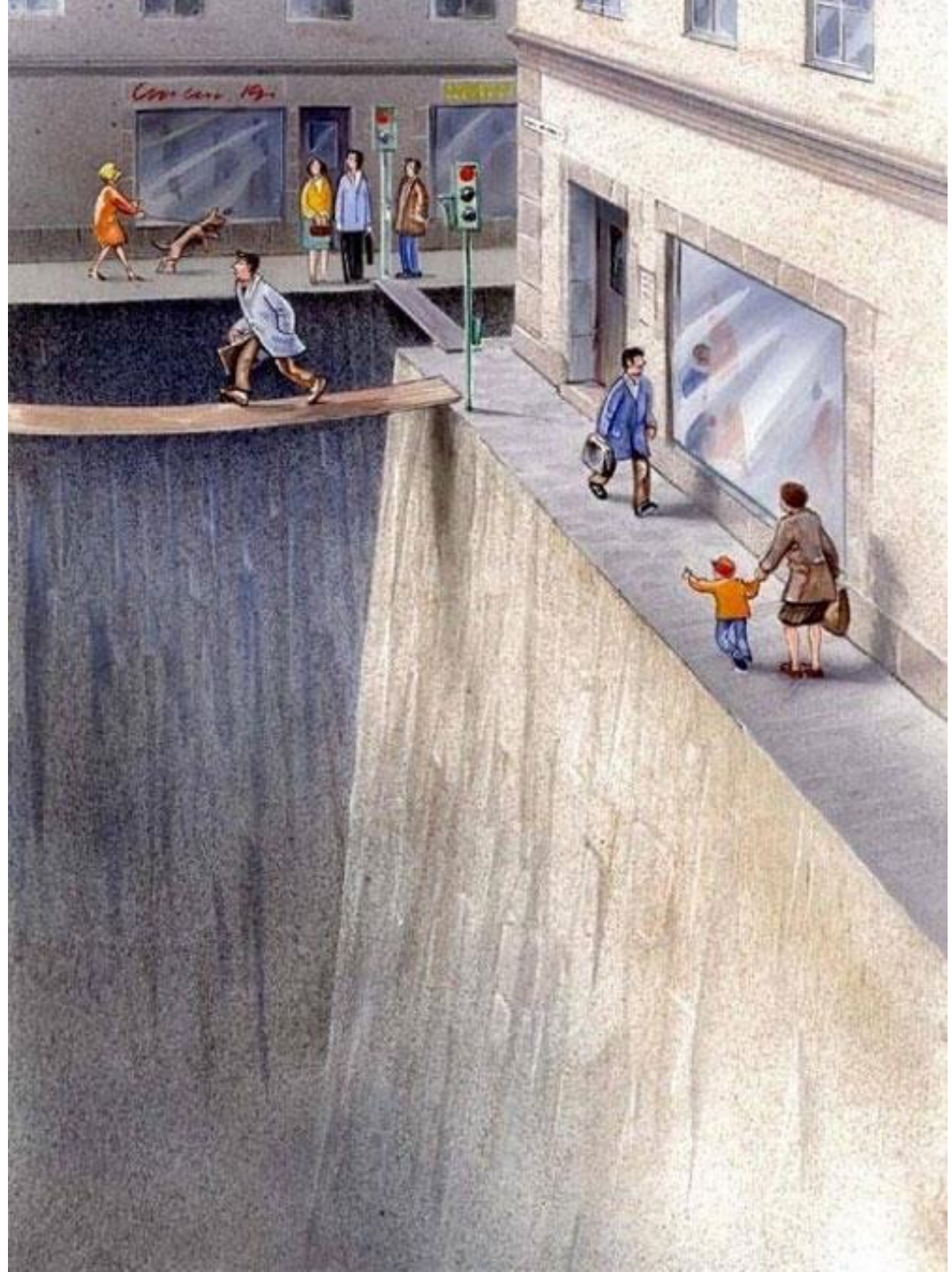

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planeo n°21

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f Transport
A

Shared mobility

Electric vehicles on-demand

Join the sharing revolution for a better tomorrow

ZERO EMISSIONS

Zilch cars are all 100% battery electric. There's no petrol or diesel used in Zilch cars

REDUCED CONGESTION

One shared car can replace 10 privately used vehicles, freeing our city streets

SAFER ROADS

All our cars are ANCAP 5-star rated, full of the latest safety technology

SHARE THE LOVE

Shared private & public use means anyone over 21yrs can drive Zilch cars

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Shared mobility

- Vauban, Freiburg

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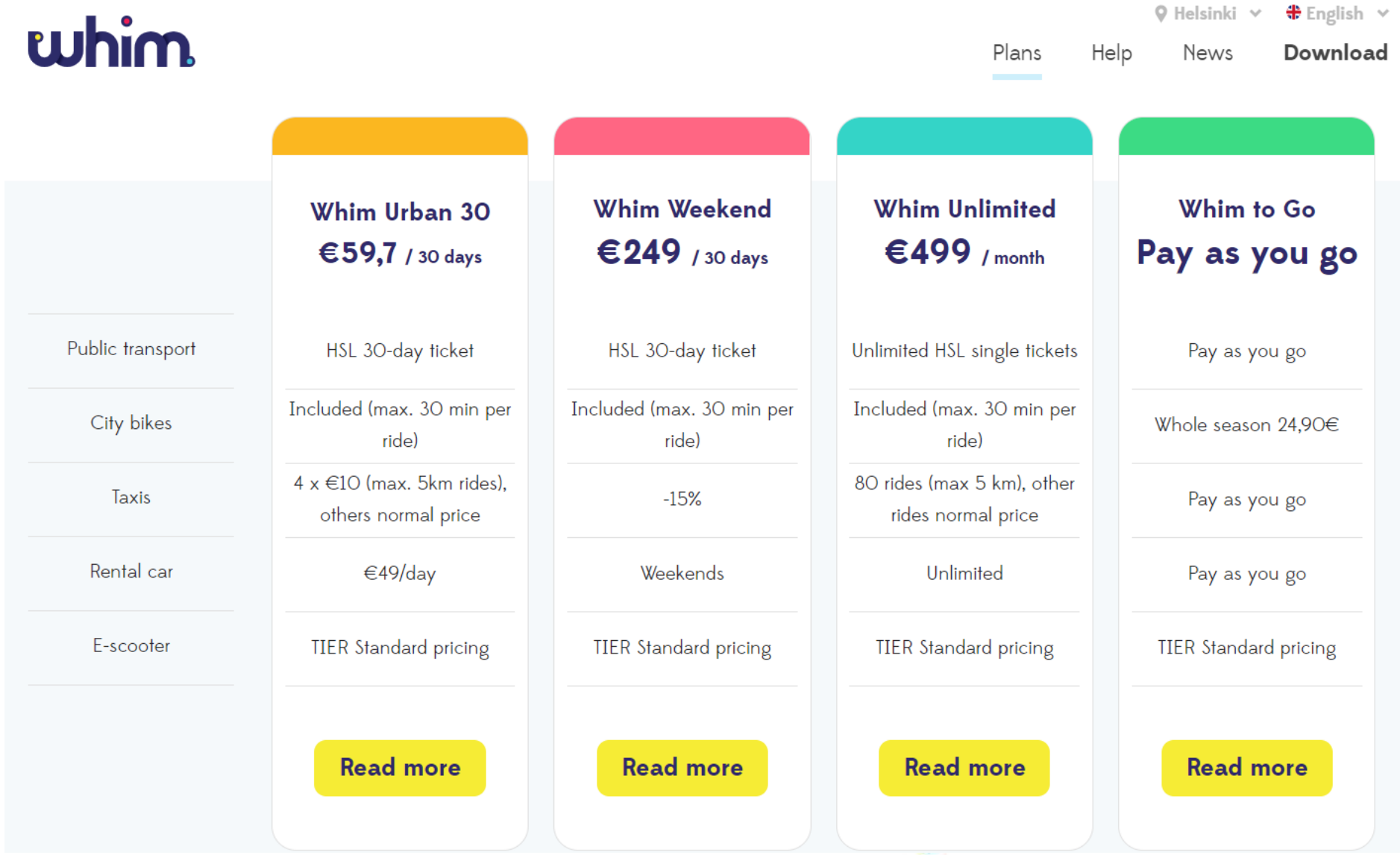
Mobility as a service (Maas)



1€ = NZ$1.80

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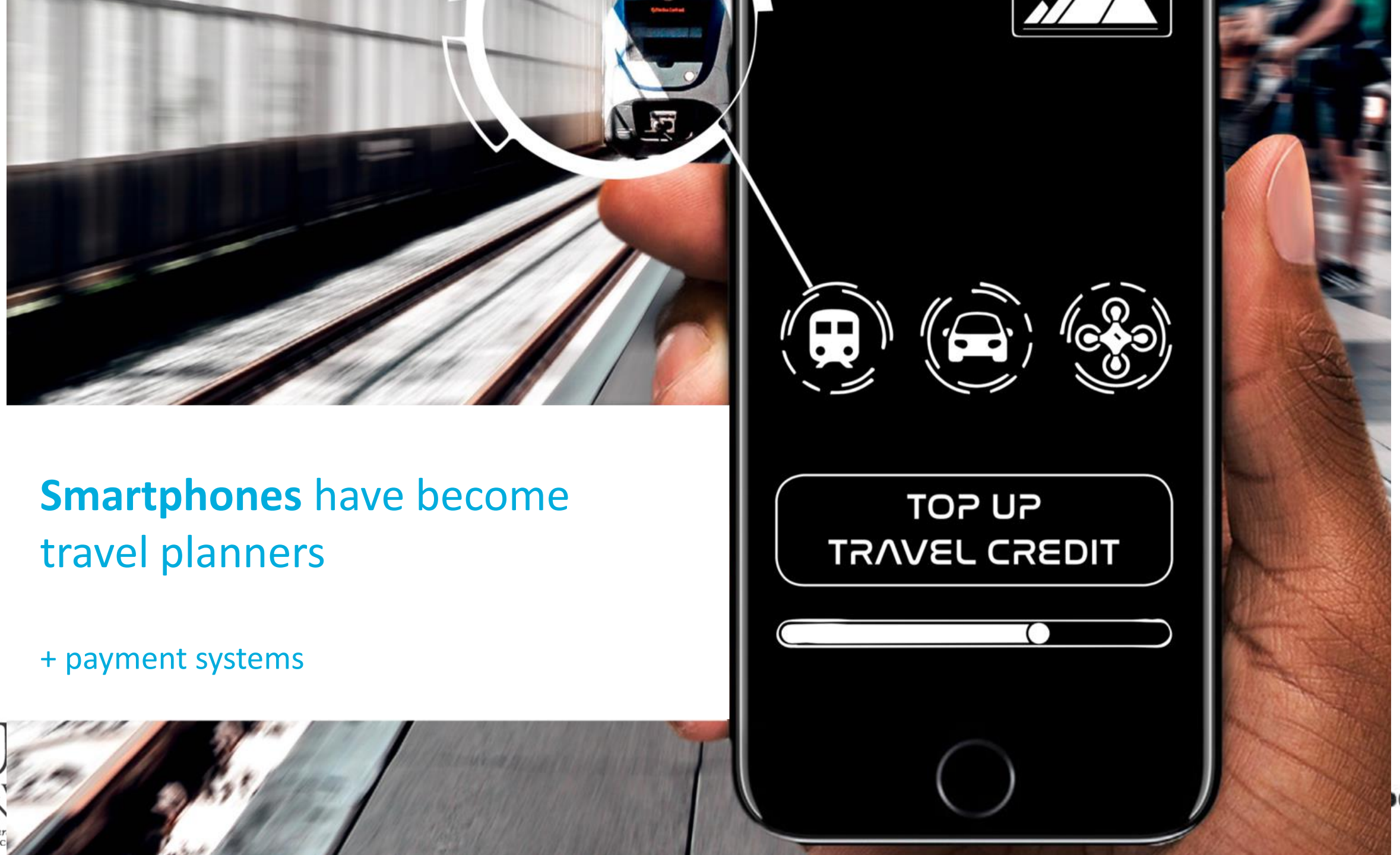

Smartphones have become travel planners

+ payment systems

Smartphone transport Apps

Active travel

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Living Streets Aotearoa

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electronic Road User Charges (eRUC)

electronic Road User Charges (eRUC)

Currently 50% fuel excise/ 50% RUC

Distance

Road Space?

electronic Road User Charges (eRUC)

- Network efficiency/manage congestion
  - Potential for variable trip cost by time and space
  - Could encourage PT
- ‘Track’ dangerous driving (e.g. speed)

A future vision?

… and the role of transport

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Tomorrowland

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Fifth Element

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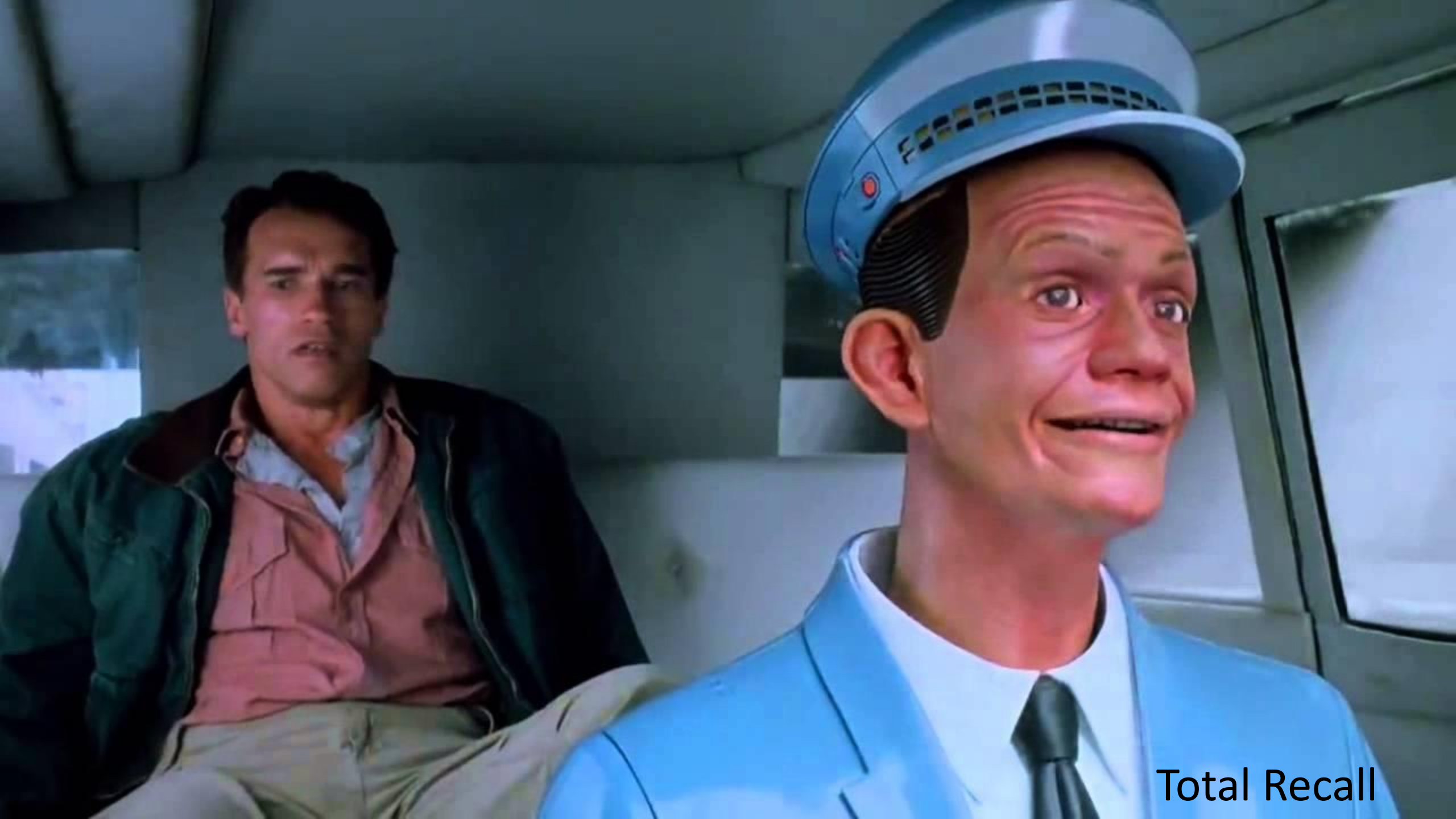
Total Recall

I am Legend

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Turbo Kid

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Black Panther

Freiburg, Germany

UC
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CANTER
Te Whare Wānanga
CHRISTCHURCH NE

sport


Freiburg, Germany

Freiburg, Germany

Vathorst, Netherlands


fietsstraat
auto te gast
Groot Wezenland

If you plan cities for cars & traffic, you get cars & traffic. If you plan for people & places, you get people & places - Fred Kent

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Thanks

Prof Simon Kingham

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